



V
Vermont



Governor's Commission on Climate Change

Transportation & Land Use Technical Work Group Teleconference Meeting #1

October 16, 2006

 VERMONT
ENVIRONMENTAL CONSERVATION

 CCS
CENTER FOR CLIMATE STRATEGIES

Introductions

- Technical Work Group (TWG) members
- VT DEC
- CCS TWG leaders
- Public

Today's Agenda

- Introductions
- Purpose and goals
- Review of the GCCC-PG and TWG process
- Review and discussion of the Vermont emissions inventory & forecast
- Review and discussion of the Catalog of State Actions
- Next Steps for TWGs
- Agenda, time, and date for next meeting
- Public input and announcements

Part 1

- GCCC-PG and TWG Process

Purpose & Goals

- December 5, 2005 Letter from Vermont Governor Jim Douglas
 - Governor's Commission on Climate Change
 - Climate Action Plan by September 1, 2007
 - Vermont greenhouse gas emissions inventory and forecast
 - Policy recommendations

Roles & Responsibilities

- Process convened by Governor Jim Douglas
- VT DEC provides coordination and organization
- State agencies act as advisors
- GCCC to make ultimate recommendations to Governor
- GCCC created Plenary Group (GCCC-PG) to provide broader stakeholder input across Vermont sectors and life
- TWGs advise Plenary Group
- Public input and review
- CCS provides evaluative facilitation, final report

Timing

- GCCC Plenary Group meetings
 - September, November, January, March, May, July
- TWG calls
 - Regularly scheduled
 - Two to three 90-minute calls between each Plenary Group meeting
- Work Products
 - GHG inventory & forecast
 - GCCC report to the Governor: September 2007

Ten Step Work Plan

1. Develop initial GHG inventories and forecasts
2. Identify possible GHG mitigation options
3. Identify initial priorities for evaluation
4. Evaluate supply potential, cost effectiveness; additional and feasibility issues as needed
5. Identify barriers, alternative policy design needs
6. Modify, add or subtract options as needed
7. Evaluate cumulative results of options
8. Iterate to consensus, with votes as needed
9. Aggregate options into implementation scenarios
10. Finalize recommendations and report language

TWG Next Steps

- Review and revision of Vermont greenhouse gas (GHG) inventory and forecast
- Identify “priorities for analysis” from catalog of states’ actions
 - Add existing and new VT options as needed
 - Rank and screen options
 - Suggest initial “priorities for analysis” to the GCCC-PG

Sample Potential Options - Agriculture

Option No.	Climate Mitigation Option	Priority for Analysis	Potential GHG Emissions Reduction	Potential Cost or Cost Savings	Ancillary Impacts, Feasibility Considerations	Notes
AFW-1	AGRICULTURE – PRODUCTION OF FUELS AND ELECTRICITY					
1.1	Manure Digesters/Other Waste Energy Utilization**					
1.2	Biodiesel Production (incentives for feedstocks and production plants)					
1.3	Biomass Feedstocks for Electricity or Steam Production**					
1.4	Ethanol Production					

Decision Criteria

- GHG reduction potential (CO₂e)
- Cost per ton GHG removed
- Additional issues
- Feasibility issues

Policy Template



Policy Description:

Policy Design:

- **Goals:**
- **Timing:**
- **Coverage of Parties:**

Implementation Methods:

Related Policies/Programs in Place:

Estimated GHG Savings and Costs per tCO₂e:

- **Data Sources:**
- **Quantification Methods:**
- **Key Assumptions:**

Key Uncertainties:

Additional Benefits and Costs:

Feasibility Issues:

Status of Group Approval:

Level of Group Support:

Barriers to Consensus:

End Product/Final Report

- Executive Summary
- Background, Purpose and Goals
- Policy Recommendations and Results
 - Agriculture, Forestry & Waste Management
 - Energy Supply
 - Residential, Commercial, Industrial
 - Transportation & Land Use
 - Cross-Cutting Issues
- Appendices

Part 2

- VT Greenhouse Gas Inventory and Forecast review

Vermont GHG Emissions

- Inventory and Reference Case Projections
- Initial analysis by CCS for further discussion and final revision
 - Inventory of historical emissions from 1990 to most recent data year (2000-2004, depending on sector)
 - Projection of emissions to 2020

Coverage

- Six gases per USEPA and UNFCCC guidelines
 - Carbon Dioxide (CO₂), Methane (CH₄), Nitrous Oxide (N₂O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulfur Hexafluoride (SF₆)
 - Black Carbon considered separately
- All major emitting sectors
 - Electricity
 - Residential, Commercial, Industrial Fuel Use
 - Transportation
 - Agriculture and Forestry
 - Waste Management
 - Industrial Processes and Other Sources

Inventory Approach

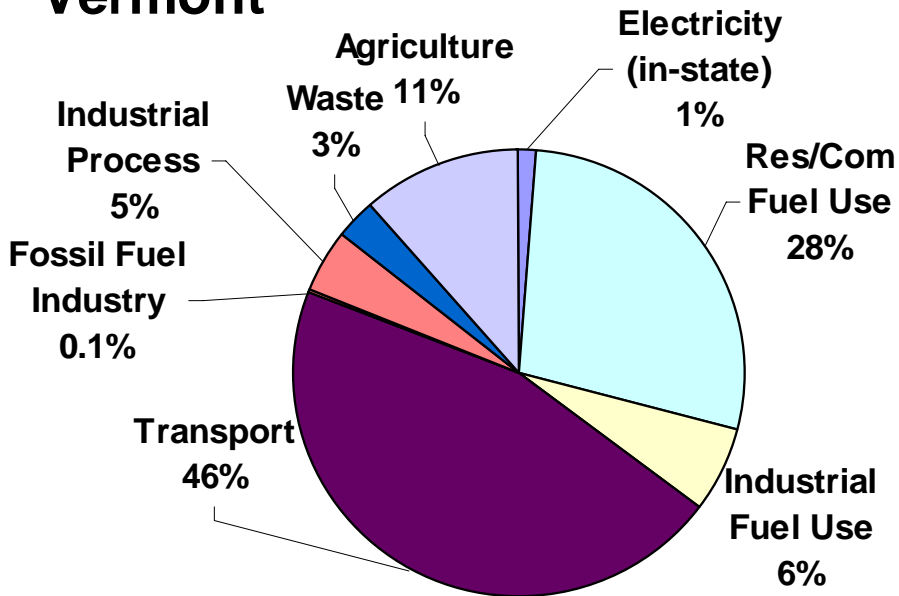
- Standard US EPA and UN methodologies, guidelines, and tools
- Emphasis on transparency, consistency, and significance
- Preference for Vermont or regional data, where available
- Consumption and production-basis emissions from electricity generation
 - Very simplified approach used for initial analysis

Projection Approach

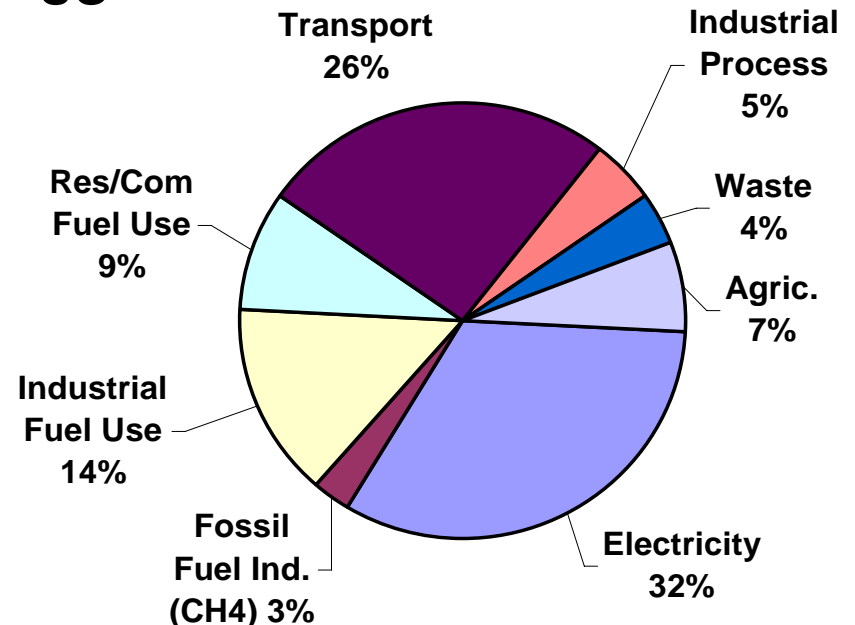
- Reference case assumes no major changes from business-as-usual
 - Includes approved policies and actions to the extent possible (e.g. Environmental Portfolio Standard)
- Growth assumptions from existing sources
 - US Census and Bureau of Labor & Statistics
 - US Energy Information Administration
 - Regional Planning Organizations (e.g. Mid-Atlantic – Northeast Visibility Union or MANE-VU)

Vermont & US Emissions By Sector, Year 2000

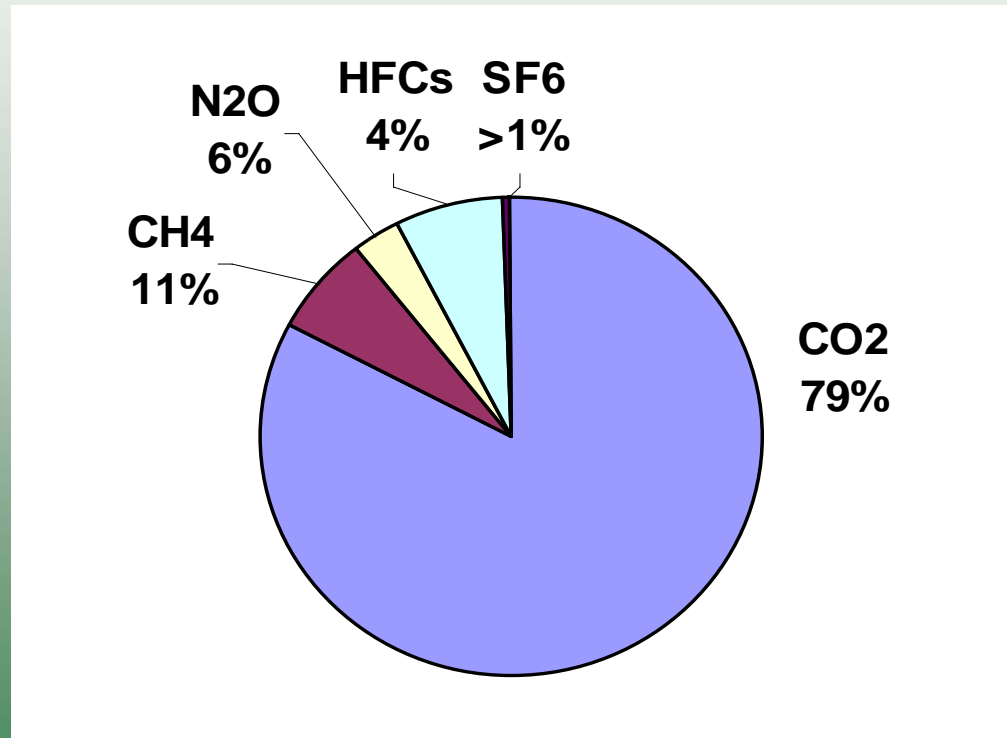
Vermont



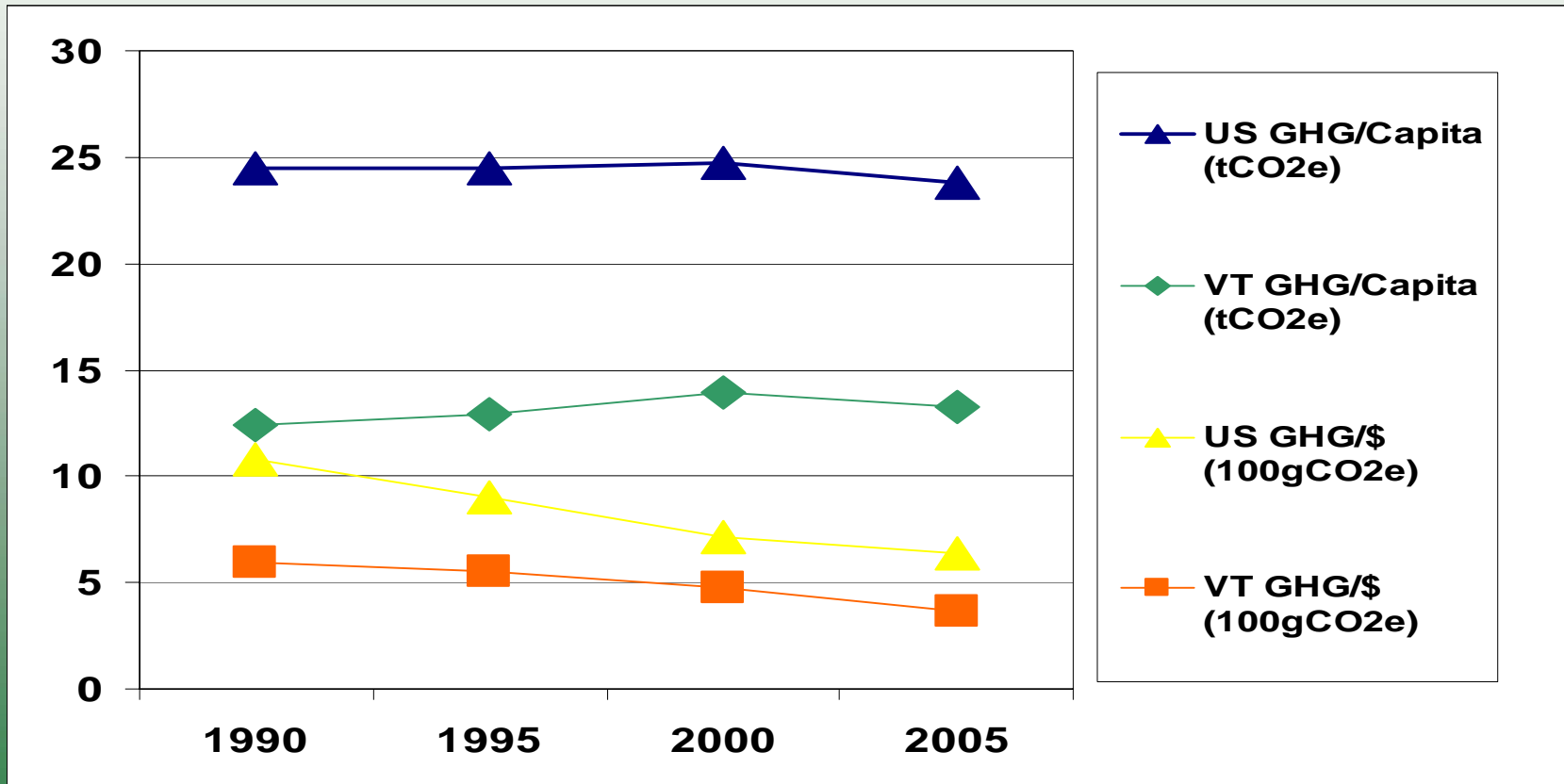
US



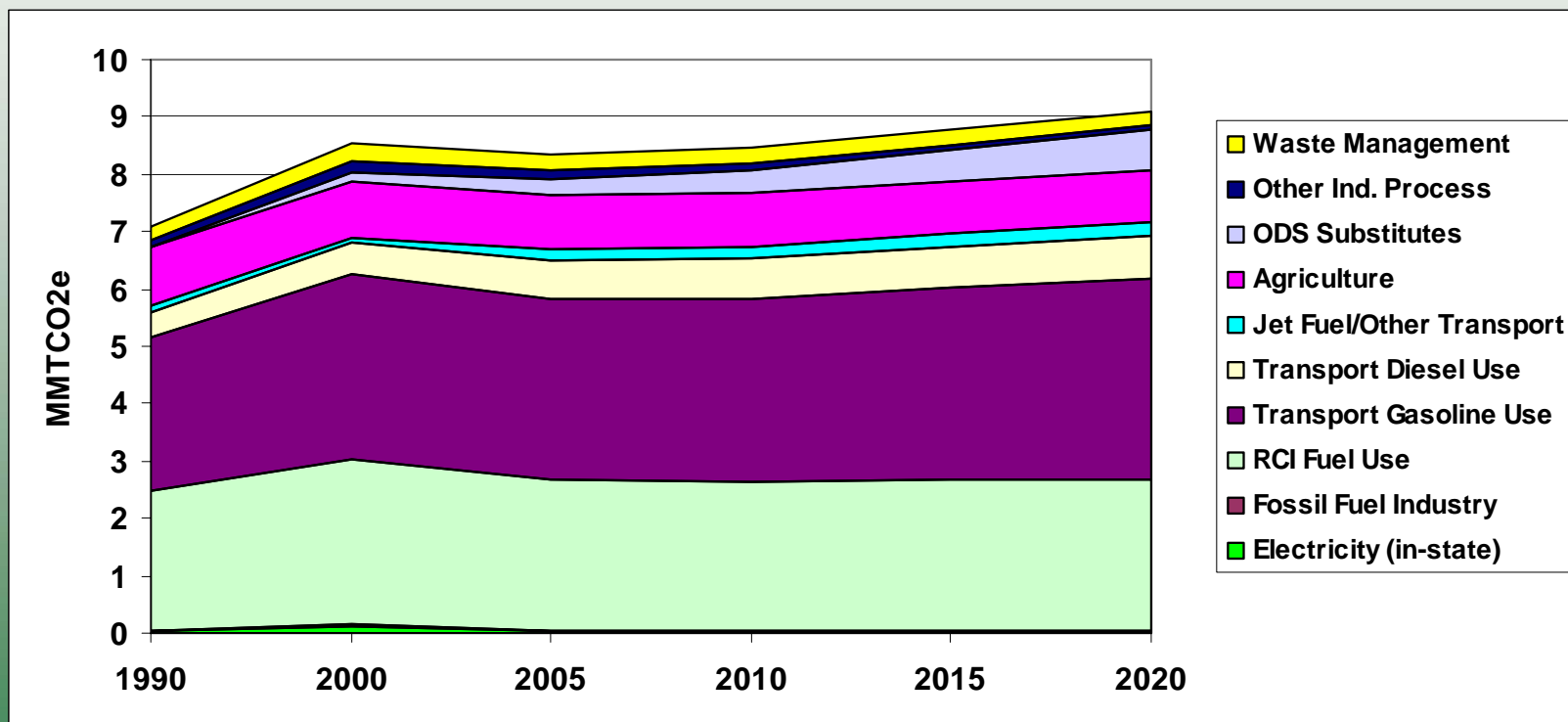
Vermont Emissions By GHG, Year 2000



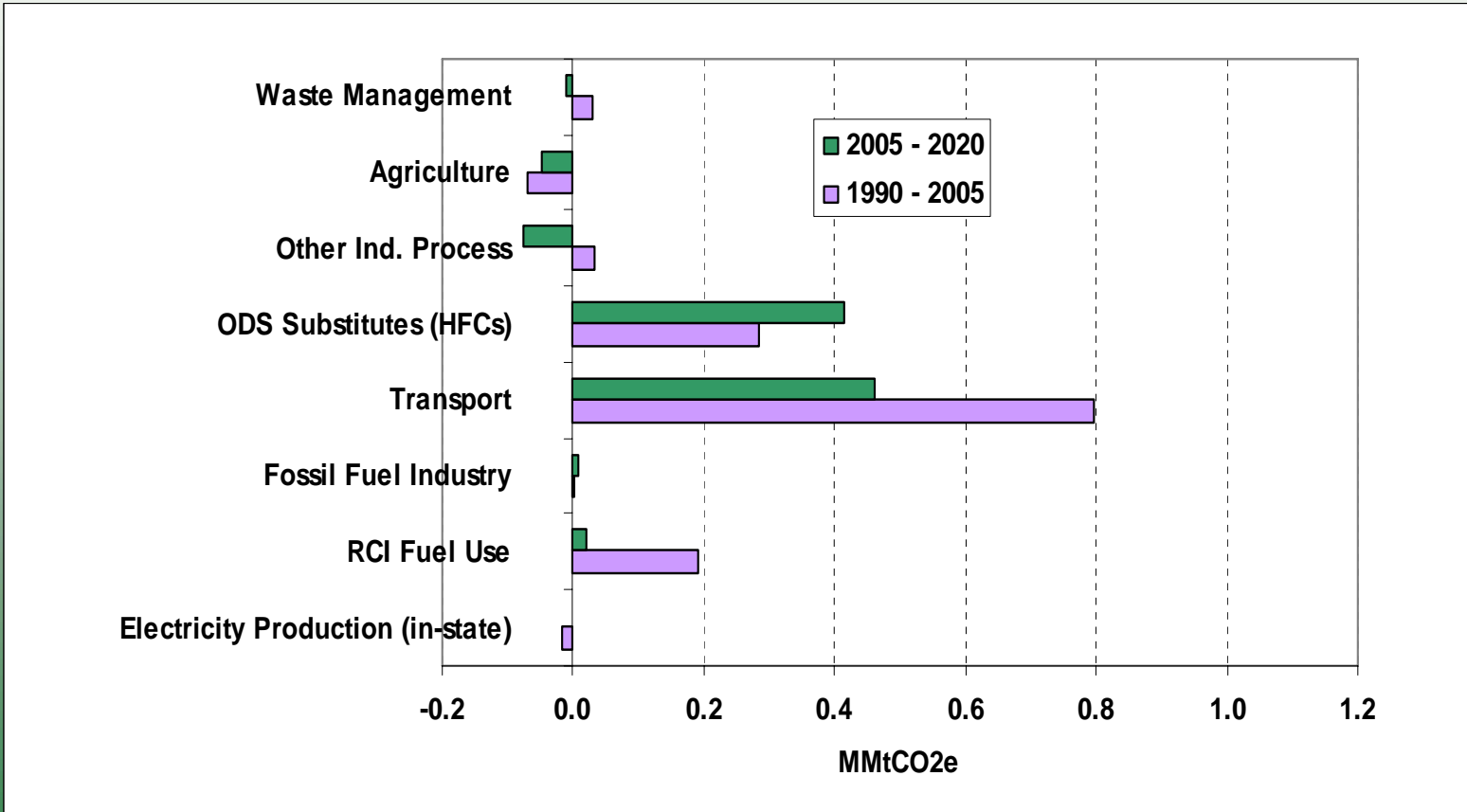
Per Capita and GSP/GDP GHG Emissions, 1990-2002



Gross Vermont GHG Emissions By Sector, 1990-2020



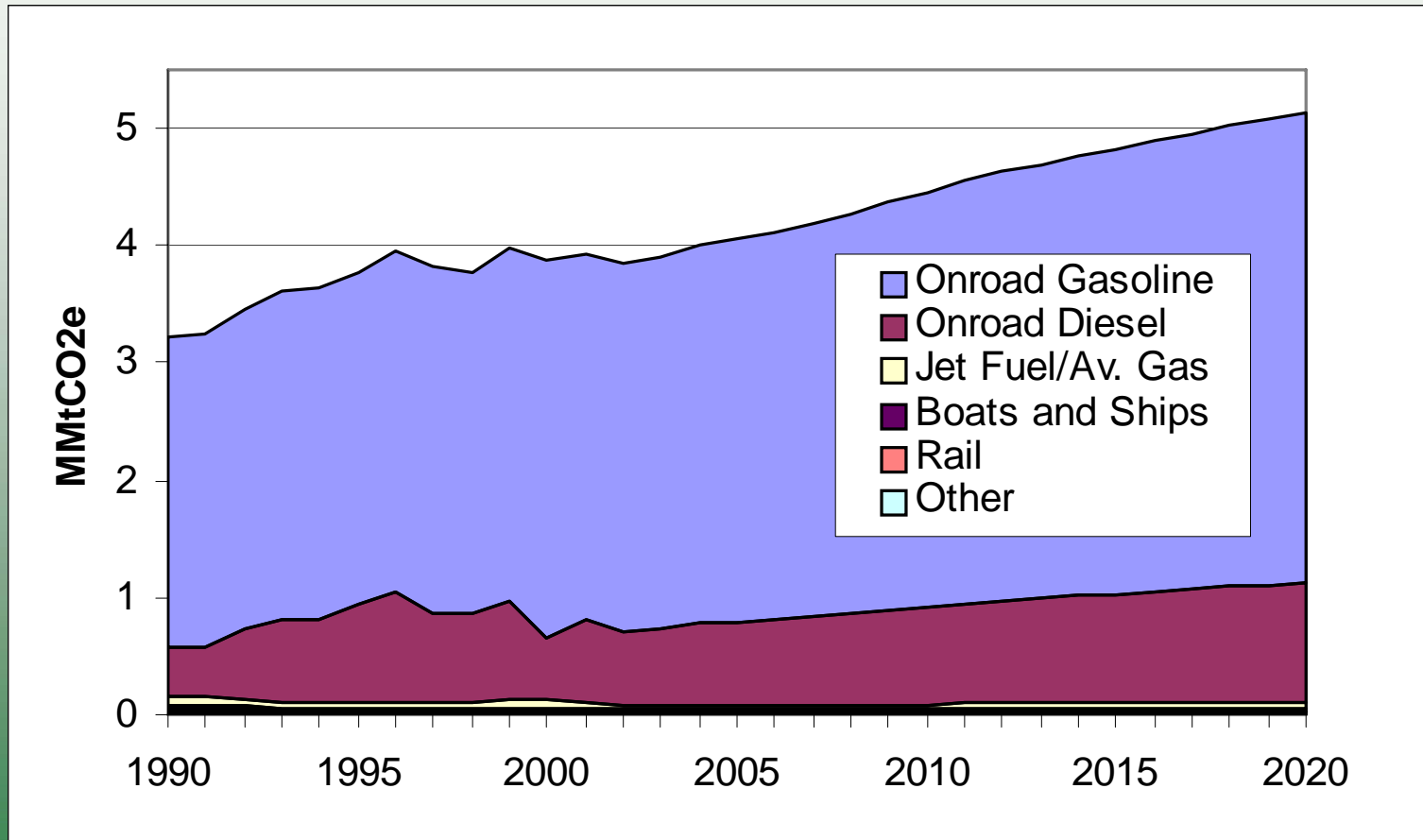
Vermont Emissions Growth



Key Points

- Preliminary draft for TWG review and revision, as needed
- Helpful for diagnosis of GHG emissions, but not a compliance baseline
- Consumption v. production methods
- Role of carbon storage

Transportation



Transportation

- Data Sources
 - EIA State Energy Data (SED) historic consumption by fuel
 - EIA rail and marine diesel consumption estimates
 - FHWA marine gasoline consumption estimates
 - VTrans Historic VMT estimates
 - EIA Annual Energy Outlook 2006 (AEO2006)
 - MANE-VU Mobile Source Inventory VMT Projections
 - VTrans Aviation Projections

Transportation

- Methods
 - Inventory (1990-2002)
 - CO₂
 - Fuel consumption multiplied by emission factors
 - Onroad CH₄ and N₂O
 - VMT estimates from VTrans allocated to vehicle types using HPMS data
 - Estimates based on VMT by vehicle type, EPA default vehicle age and control technology distributions, and vehicle/control technology specific emission factors
 - Nonroad CH₄ and N₂O
 - Fuel consumption multiplied by emission factors

Transportation

- Methods
 - Projections (2003-2020)
 - Onroad Gasoline and Diesel CO₂
 - AEO2006 regional fuel consumption forecasts adjusted using ratio of state to regional gasoline and diesel VMT from MANE-VU inventory
 - Diesel projections adjusted by subtracting expected biodiesel consumption provided by VT Biofuels Association
 - Onroad CH₄ and N₂O
 - VMT from MANE-VU onroad inventory and projections
 - Aviation
 - VTrans Airport Operations Projections
 - General aviation projections applied to aviation gasoline, commercial operation projections applied to jet fuel
 - Other Nonroad
 - AEO2006 regional fuel consumption forecasts adjusted using ratio of state to regional population

Transportation

- Key Assumptions
 - HPMS vehicle mix
 - EIA regional fuel consumption projections
 - MANE-VU VMT projections
- Key Uncertainties
 - Projection data
 - Inclusion of international bunker fuels in jet fuel consumption estimates

Part 3

- Draft Potential GHG Mitigation Options

CCS Catalog of State Actions

- Actions undertaken or considered by a wide variety of US states
- Many actions provide GHG reductions coincidentally or as a co-benefit
- Cover all economic sectors
- Cover many implementation mechanisms

Categories of Transportation Actions

- Reduce travel demand for passengers and freight (location efficiency, community design, mode choice)
- Reduce vehicle emissions for cars and trucks
- Expand use of low emitting (renewable) fuels
- Remove fine particulates (black carbon or soot)
- Reduce emissions from service equipment

Categories of Cross-Cutting Actions

- Inventory and Forecasts
- GHG Reporting
- GHG Registry
- Public Education and Outreach
- Adaptation
- Goals/Targets
- State's Own Emissions

Next TWG Call

- Agenda:
 - Discuss potential priorities for analysis of policy options
 - Review the Vermont emissions inventory and projection
 - Tentative: Thursday, November 9, 2006 from 1:00 3:00 p.m.



Public Input, Announcements